Please replace paragraph **[0037]** as follows:

[0037] Fig. 3e shows a speech pattern that is recreated from the original speech pattern of Fig. 3a including the bursty frame erasure of Fig. 3c. As shown in Fig. 3e using the present error concealment method reduces a distortion caused by the bursty frame erasure. As described above, this is accomplished by combining the modification of scaling factors and the reestimation of codebook gains, and thus, improving decoded speech quality.

Please replace paragraph **[0039]** as follows:

[0039] As evident from the figures, compared to the error-free spectrum, the present error concealment method gives a more accurate spectrum of the erased frames, especially in low frequency regions, than the extrapolation method. Further, the present error concealment method recovers the error-free spectrum more quickly than the conventional extrapolation method.

REMARKS

Claims 1-22 are pending in this Application. By this Preliminary Amendment, the specification is amended. No new matter is added.

The attached Appendix contains marked-up copies of each rewritten paragraph (37 C.F.R. §1.121(b)(iii)).

In view of the foregoing amendments and remarks, Applicants submit that this Application is in condition for allowance. Favorable consideration and prompt allowance of claims 1 - 22 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this Application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

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JAO:JSK/kap

Attachment:
Appendix

Date: January 23, 2002

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DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

APPENDIX

Changes to Specification:

The following are marked-up versions of the amended paragraphs:

[0014] As described above, a currently used method of error correction is the extrapolation method. For example, in IS-641 speech coding, the number of consecutive erased frames is modeled by a state machine with seven states. State 0 means no frame erasure, and the maximum number of consecutive erased frames is six. During operation, if the ~~i~~n-th frame is detected as an erased frame, using the extrapolation method, the IS-641 speech coder extrapolates the speech coding or spectral parameters of an erased frame using the following equation:

$$\omega_{n,i} = c\,\omega_{n-1,i} + (1 - c)\,\omega_{dc,i},\ i = 1, \ldots, p \qquad (1)$$

where $\omega_{n,i}$ is the i-th line spectrum pairs (LSP) of the n-th frame and $\omega_{dc,i}$ is the empirical mean value of the i-th LSP over a training database. The variable c is a forgetting factor set to 0.9, and p is the LPC analysis order of 10.

[0017] Fig. 2 shows an exemplary block diagram of a frame erasure concealment system in accordance with the present invention. The frame erasure concealment device 300 includes adaptive codebook I 305, adaptive codebook II 310, amplifiers 315-330, summers 340, 345, synthesis filters 350, 355 and mean squared error block 360.

[0025] The summer 340 then adds the amplified adaptive codebook vector, g_p *v(n), and the amplified fixed codebook vector, g_c *c(n), to generate an excitation signal u(n). The excitation signal u(n) is then transmitted to the synthesis filter 350. Additionally, the excitation signal u(n) is stored in the buffer along feedback path 1. The buffered information will be used to find the contribution of the adaptive codebook I 305 at the next analysis frame.

[0036] Fig. 3d shows a speech pattern that is recreated from the original speech pattern by using the extrapolation methods, shown in Fig. 3a, transmitted across a lossy channel that includes the bursty frame erasure, shown in Fig. 3~~b~~c. As shown, during the time period when the frame erasure occurs, the extrapolation method continues decreasing the gain values of the erased frames until a good frame is detected. Consequently, the decoded speech for the erased frames and a couple of subsequent frames has a high level of magnitude distortion as shown in Fig. 3d.

[0037] Fig. 3e shows a speech pattern that is recreated from the original speech pattern of Fig. 3a including the bursty frame erasure of Fig. 3~~b~~c. As shown in Fig. 3e using the present error concealment method reduces a distortion caused by the bursty frame erasure. As described above, this is accomplished by combining the modification of scaling factors and the reestimation of codebook gains, and thus, improving decoded speech quality.

[0039] As evident from the ~~Figures~~figures, compared to the error-free spectrum, the present error concealment method gives a more accurate spectrum of the erased frames, especially in low frequency regions, than the extrapolation method. Further, the present error concealment method recovers the error-free spectrum more quickly than the conventional extrapolation method.